Dear Charles Anderson:

I apologize for the late response to the request for comments on Draft 1 of ENERGY STAR Version 2.0 Roof Products Specification. I hope it is not too late for the following comments to be included with those received by the Jan. 19th cut-off date.

1. Exposure in Accordance with ASTM G7

In the section on Maintenance of Solar Reflectance, part C, on page 8, the specification calls for exposure for 3 years in accordance with ASTM G7. The latter lists several different test conditions for outdoor exposure of materials. For example, the specification for angle of exposure is missing in the Energy Star Program Requirements. Should the angle be 45 degrees facing South in the Northern hemisphere for both the low-slope and steep-slope roofs?

Also, the geographic location should be specified since test results will differ significantly depending on the climate. Outdoor tests in the U. S. are commonly carried out in either (or both) southern Florida or Arizona because of the large amount of solar radiant energy and high temperatures in these locations. Materials that are sensitive to moisture are tested in southern Florida, where the moisture content is considerably higher than in Arizona. It is prudent to also test materials in a climate that has moderate solar radiant energy, temperature and moisture.

2. Laboratory Accelerated Weathering Tests

Although to my knowledge no data has been obtained comparing laboratory tests with the 3 year exposure requirements of Energy Star for effect on solar reflectance of roofing materials, the ASTM D08.18 Subcommittee on non-bituminous roofing materials has test procedures on many types of roofing materials that have recently been updated to better simulate field conditions of solar radiation, temperature and moisture. There is a standard for each type of roofing material, but the weathering tests do not differ significantly among them. In fact, a program is currently being carried out to harmonize the weathering tests so that they will be the same for all materials.

Incorporation of laboratory accelerated weathering tests into the Energy Star Program would merely require laboratory tests on the same materials for which data has been collected by Energy Star to determine the acceleration factor for each material. The factor can differ for each material. Laboratory tests are also useful in providing more rapid information on the relative performance of different types of roofing materials.

The alternative to laboratory accelerated weathering tests is the use of the Fresnel-reflector test machine, such as Emmaqua, for outdoor accelerated weathering using concentrated natural sunlight (see ASTM G90).

If you have any questions about laboratory accelerated or natural weathering tests, I will be glad to try to answer them.

Sincerely,
Norma D. Searle, Ph.D.
Consultant in Weathering of Polymeric Materials
Tel. & Fax:954-480-8938